OEM distribution), subscriber acquisition costs, general and administrative, retail and OEM product development, depreciation costs, and interest expense.

- **An improvement in all revenue categories including**: subscription revenue, advertising revenue, and equipment revenue.

III. Synergies and Cost Savings

6. *Satellite Operations.* Today, both companies maintain primary and backup satellite uplink, control and transmission capabilities, with a total of four sites engaged in such activity between the two companies. In the near term after the merger, one primary and one backup facility will be sufficient for such purposes, resulting in the elimination of two of these sites and their attendant costs, including equipment and personnel. Over the longer term, capital expenditure savings in satellite network replacement will be substantial.

7. *Broadcast Operations.* Additionally, there will likely be redundant studio operating costs and network operating costs that can be eliminated. Today, both companies are required to maintain content storage for their music title libraries and separate software to extract those titles for broadcast. The merger would allow consolidation of storage and retrieval. The combined company would be able to eliminate redundant content delivery infrastructure, such as ISDN lines that deliver content to the satellite uplink, as well. Duplicative costs associated with webstreaming can also be eliminated.

8. *Terrestrial Networks.* Duplicative costs associated with the terrestrial repeater networks of the two companies can be eliminated. XM currently has approximately 800 terrestrial repeater sites and Sirius has approximately 150. The costs to maintain these sites, including site leases and maintenance can be rationalized by a merged entity through co-location of repeaters. Incremental costs to identify repeater locations and install equipment can also be reduced through co-location of new equipment.

9. *Programming and Content.* Today, both companies have separate content acquisition and programming production costs. A combined company will be able to eliminate duplication in the overhead and production of similar channels, including duplicative and expensive production facilities and personnel. In addition, the companies will be able to improve scale economies. Moreover, satellite radio will become a more compelling distribution outlet because the combined firm will allow content producers to reach a larger audience than possible now. A significant portion of these savings will be savings in variable costs.

10. The combined company will also be able to achieve significant variable and fixed-cost savings in connection with contracts with content providers by eliminating redundant content acquisition costs. Subject to some contractual considerations, the combined company would be able to eliminate the duplicative costs to obtain this content and should be able to achieve scale economies in future contracts.

11. *Customer Service and Billing.* A combined company will be able to realize significant efficiencies in call center service procurement because contracts for these services generally include discounts for call volume, and the combined company would expect roughly double the call volume. The combined company will also be able to eliminate duplicative IT infrastructure costs associated with network and hosting, licensing and software development/maintenance, and outbound communications with subscribers.

12. *Sales and Marketing.* Substantial fixed- and variable-cost savings are expected from the elimination of overlapping marketing expenses and through benefits ensued to retail and OEM distribution partners.

- Marketing. Cost savings are expected from elimination of duplication in marketing such as market research, sponsorships, attendance at trade shows and other events, advertising buys, website development costs, and other promotional materials. Economies of scale will allow the combined company to achieve savings in advertising and promotion costs. The merged firm will be able to internalize the "spill-over" effect (the phenomenon whereby each standalone company benefits from the marketing efforts of the other, and neither is able to capture all of the benefits of its own marketing efforts). Thus, the combined firms marketing efforts will be more efficient, resulting in a greater return per advertising dollar spent.

- Retail distribution. Given the duplicative coverage of the retail marketing organizations, there will be some rationalization in personnel and effort arising from the merger. Significant field support is needed to stock and maintain retail point of sale materials and train retail personnel about satellite radio service, and duplication in these efforts can be eliminated. The combined firm will result in higher sales per square foot through the availability of better and more innovative products on retail floors. In addition, retail distribution expenses will be reduced by allowing for single brand point of sale materials, which will free up in-store and advertising circular space, while also reducing retailers' promotional spending requirements for satellite radio.

- OEM Distribution. The merged company will offer an improved value proposition to its OEM distribution partners. As conversion and retention rates increase over time through enhanced programming choices, OEM partners will experience an overall revenue share lift from a larger satellite radio subscriber base, further motivating OEM partners to install and market satellite radio.

- OEM Contracts. If the new combined offerings provide the company and its OEMs additional value through improvements in churn, conversion rate, revenue share and customer satisfaction, it is likely that contract term negotiations will result in improved economics and reduced variable costs for the combined company.

13. *Subscriber Acquisition Costs* One of the major expenses faced by both companies today is the cost to acquire subscribers, including subsidizing initial equipment costs for subscribers. Post-merger, the combined company will have the opportunity to consider all of the current hardware offerings and streamline the product offering by eliminating products, including receivers and accessories, that have significant feature overlap. In addition, the combined company will be able to achieve significant scale economics in sourcing materials and chip sets and in absorbing manufacturing overhead and shipping costs, lowering production costs of both aftermarket and OEM radios. The company will also be able to reduce overall field inventory requirements and will be able to reduce obsolescence and close out costs through more effective inventory management.

14. *General and Administrative.* The merged entity will realize significant efficiencies in general and administrative ("G&A") expenses. These include the elimination of overlapping executive management costs, elimination of duplication and efficiencies in real estate, reduced insurance costs, and elimination of duplicative legal, investor relations, and external accounting and auditing costs. The merged company will also experience reductions in

overlapping human resources, accounting, and information technology personnel and systems costs. These reductions will result in cost savings that run the gamut from lower telecommunications expenses to savings on office supplies.

15. *Retail and OEM Product Development.* Today, both companies have their own engineering and design groups working independently on next generation products and services. The merged entity will be able to draw from the best of these two groups and will be able to focus efforts on accelerating the introduction of new services, products, and features. The merger will also increase incentives to speed interoperable radios to market. In addition to these benefits, the combined company will be able to reduce overall spending on design and development.

16. *Depreciation Costs.* The merged entity will realize significant efficiencies in capital expenditures related to satellites, leasehold improvements, furniture and fixtures, software development and license costs, computers, servers, switches, routers and other IT equipment, terrestrial repeater costs and future satellite construction and launch costs. The effect of these capital expenditure savings will be to reduce future depreciation costs.

17. *Other Income.* Many of the efficiencies realized by the merged entity will result in efficiencies for the Canadian affiliates of the two companies. This will result in a reduced share of losses for those companies or an improved share of net income.

18. *Interest Expense.* The merged entity will have superior credit quality to either of the individual companies. Thus, going forward, the cost of borrowing will be lower.

IV. Increased Revenue

19. *Subscriber Revenue.* In connection with the merger, the combined company will be able to offer a variety of lower priced programming packages, including packages that allow consumers more choice over the content they receive. The combined company will also be able to extend the reach of previously exclusive content. Sirius anticipates that this will result in increased subscription revenue.

20. Increased subscription revenue will result from three sources. First, lower price points and greater content choice, including the availability of previously exclusive content, will create greater "primary demand." That is, more consumers will be interested in subscribing to satellite radio because it will be available at a lower entry price and with greater choice of individual channels by the customer. Though satellite radio has approximately 14 million subscribers today, there is an untapped market of individuals that are interested in the service but perceive the single $12.95 price option as too high for the content they want. Lower priced packages will allow consumers to trial service at a lower price. Once these subscribers experience satellite radio, Sirius anticipates that many of them will opt for higher-priced packages.

21. Second, the lower priced plans will improve the conversion rates of OEM customers that receive bundled or promotional packages, because these customers

will have an option to maintain their subscription at a lower price point rather than canceling their service after the promotional period.

22. Third, the new packages will decrease churn among "self-pay" subscribers who remain interested in the service, but prefer a lower price point. For example, a subscriber currently receiving service at $12.95 that is considering cancelling service may instead decide to switch to a less expensive package, such as the $6.99 a la carte package.

23. In addition, Sirius anticipates that primary demand will improve as a result of increased brand awareness from combining the two companies' marketing efforts behind a single brand. Focusing marketing efforts behind a single brand will better position the combined company to cut through the barrage of products marketed to consumers today.

24. *Advertising Revenue.* The merger of Sirius and XM will result in one satellite radio company with a combined audience of 14 million subscribers. As described above, Sirius anticipates that the new programming packages and use of other best practices will result in an increased rate of subscribership. Because of the increased reach of the combined satellite radio provider, it will be able to offer a larger, more attractive and targeted subscriber base to advertisers and will thus be able to increase advertising revenues. Without the merger, the two companies can only offer advertisers access to their smaller individual subscriber bases. This does not generate the same interest from advertisers, and in the aggregate would represent less advertising revenue than the merged entity.

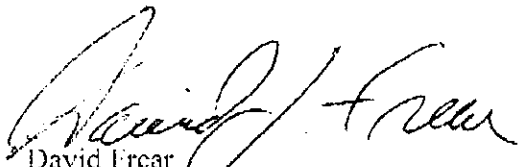
25. *Equipment Revenue.* Today, both XM and Sirius maintain online stores offering radios, accessories, and subscriptions for sale directly from each company. In the future, by consolidating the websites, combining resources, and using combined best practices to direct consumer efforts, the combined company will compete more effectively for consumer attention in retail marketing, increasing the company's share of the sales of radios and accessories. In addition to an increase in the number of purchases and therefore revenue from the website, subscriber acquisition costs will decline because the combined company will not have to pay retail commissions for subscriptions purchased directly through the company's own website and will earn a margin on the equipment sold.

26. *Other Revenue.* The merged company can increase brand awareness by consolidating marketing efforts around a single brand and by marketing satellite radio itself. This will lead to higher subscription levels and revenues in the U.S. and for Canadian affiliates, increasing revenue through subscriber fees and from royalties received from the Canadian affiliates.

V. CONCLUSION

27. The combined company will experience significant merger specific efficiencies and cost savings in nearly every line item of the combined company's income statement. In addition, the combined company will experience increased revenue from subscriptions, online sales, and advertising. The resulting company will be a more effective competitor in the audio entertainment marketplace, leading to substantial consumer benefit.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.



David Frear
Executive Vice President and Chief
Financial Officer
Sirius Satellite Radio Inc.

Executed on July 23, 2007.

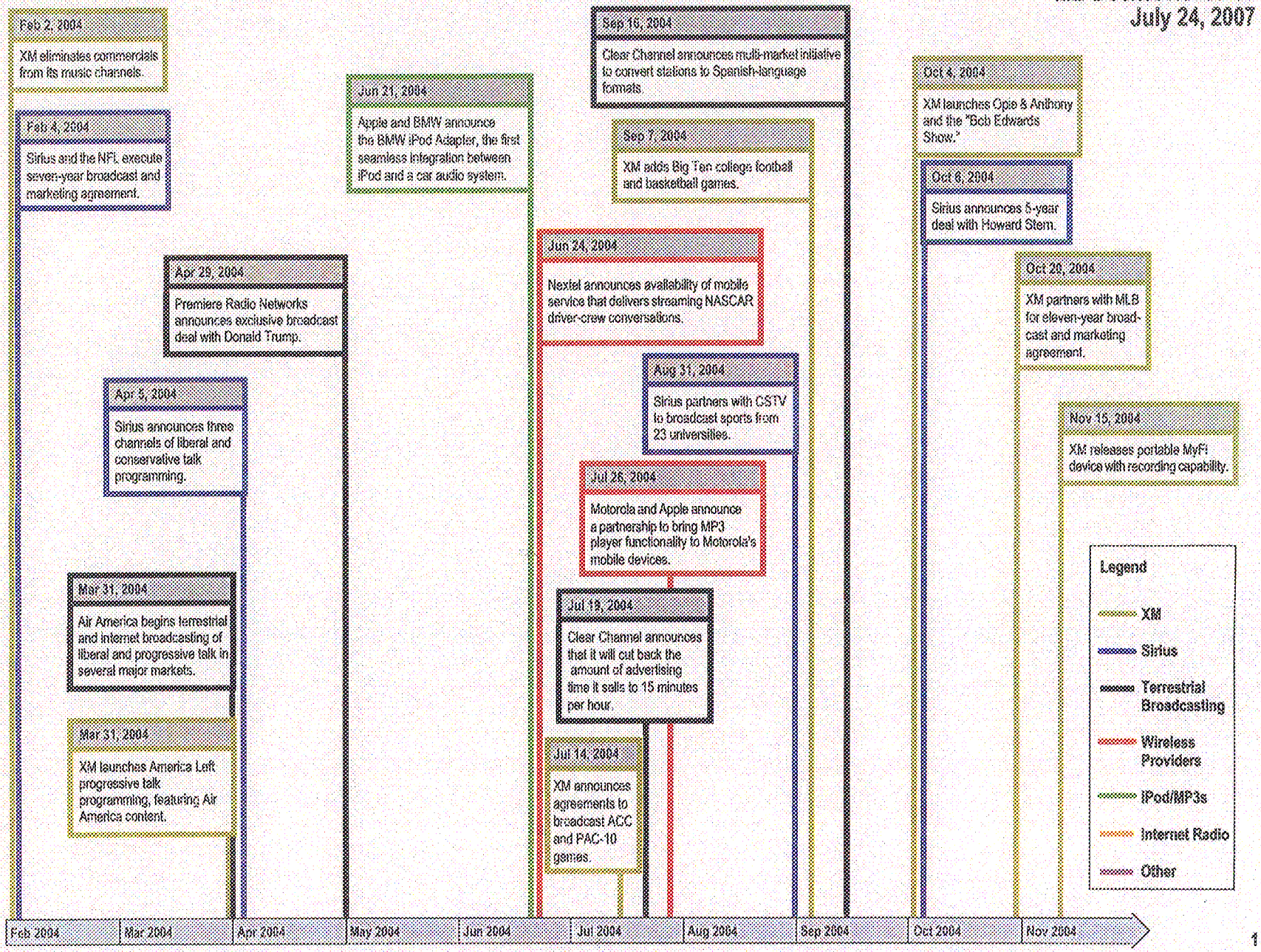
E

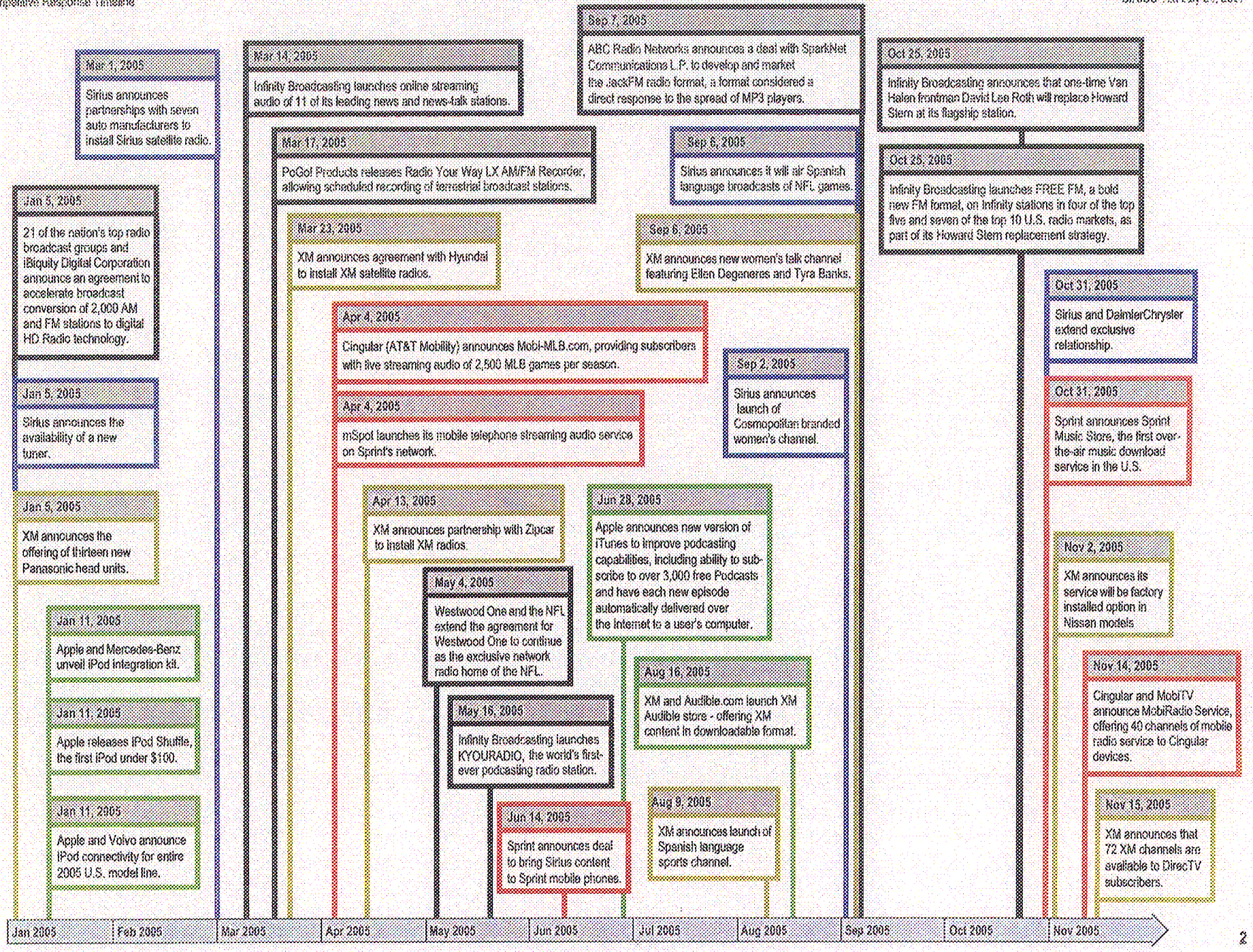
EXHIBIT E

SIRIUS-XM JOINT OPPOSITION
MB Docket No. 07-57
July 24, 2007

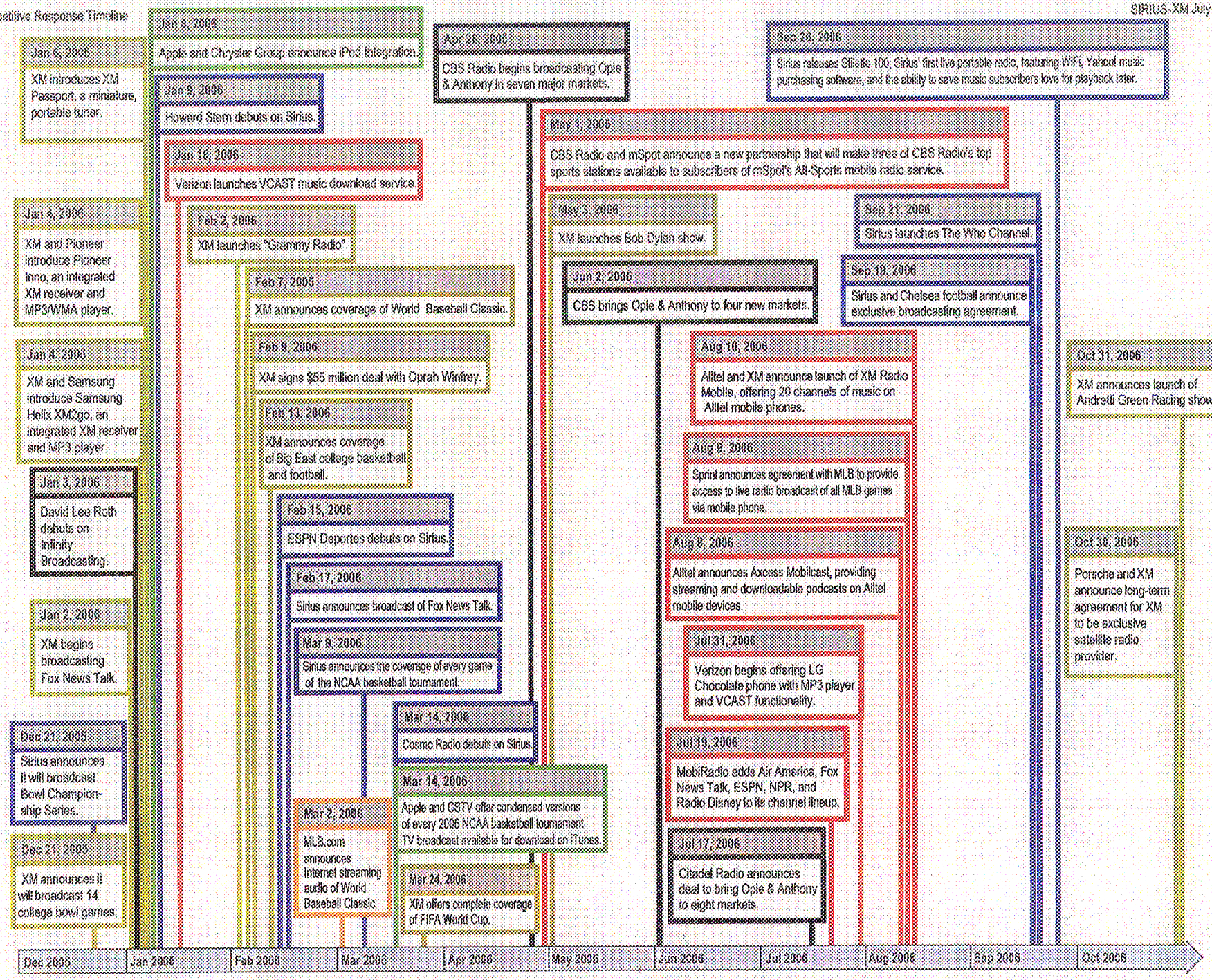
COMPETITIVE RESPONSE TIMELINE

Competitive Response Timeline



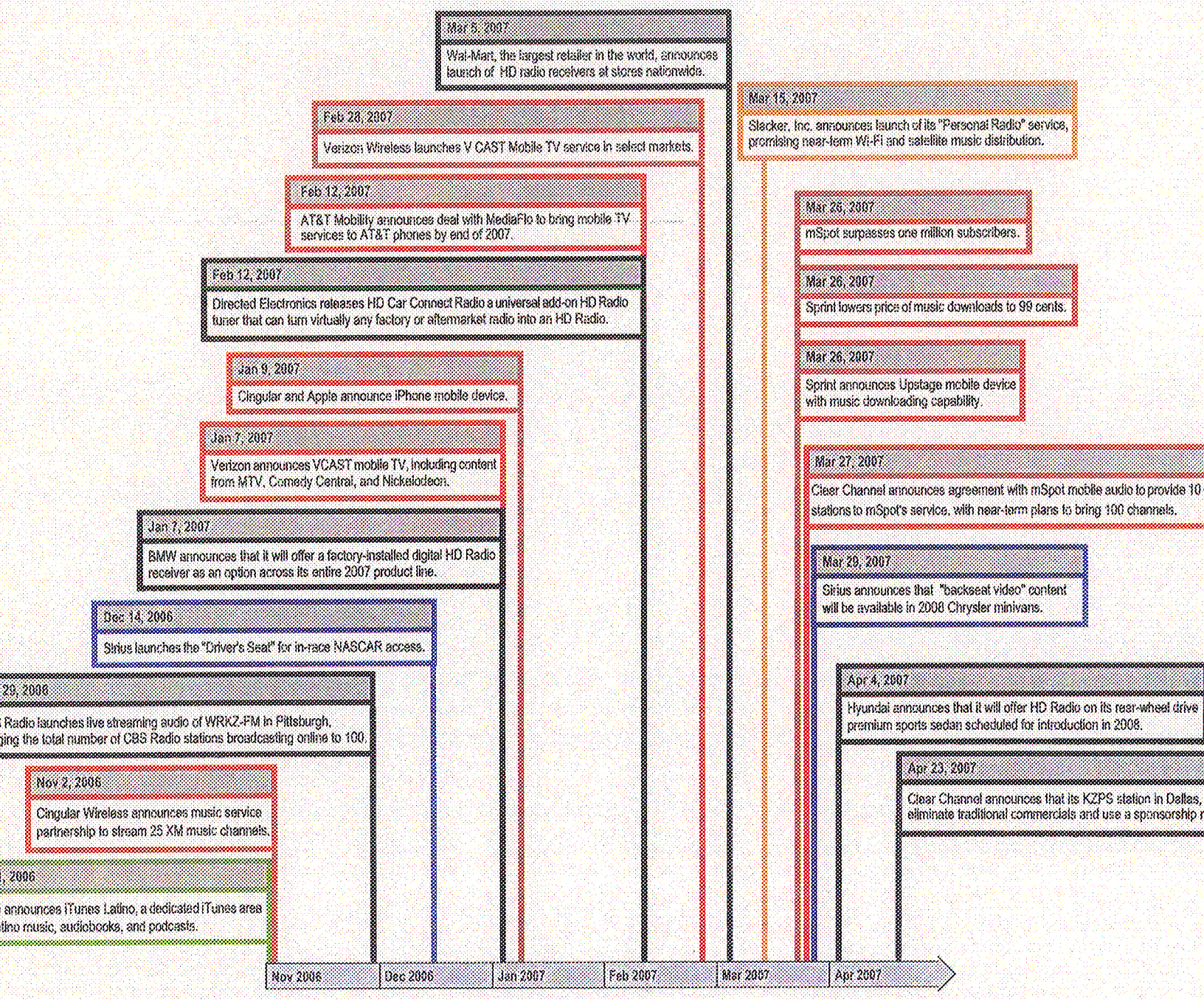

Jan 5, 2005
21 of the nation's top radio broadcast groups and iBiquity Digital Corporation announce an agreement to accelerate broadcast conversion of 2,000 AM and FM stations to digital HD Radio technology.
Jan 5, 2005
Sirius announces the availability of a new tuner.
Jan 5, 2005
XM announces the offering of thirteen new Panasonic head units.
Jan 11, 2005
Apple and Mercedes-Benz unveil iPod integration kit.
Jan 11, 2005
Apple releases iPod Shuffle, the first iPod under $100.
Jan 11, 2005
Apple and Volvo announce iPod connectivity for entire 2005 U.S. model line.
Mar 1, 2005
Sirius announces partnerships with seven auto manufacturers to install Sirius satellite radio.
Mar 14, 2005
Infinity Broadcasting launches online streaming audio of 11 of its leading news and news-talk stations.
Mar 17, 2005
PoGo! Products releases Radio Your Way LX AM/FM Recorder, allowing scheduled recording of terrestrial broadcast stations.
Mar 23, 2005
XM announces agreement with Hyundai to install XM satellite radios.
Apr 4, 2005
Cingular (AT&T Mobility) announces Mobi-MLB.com, providing subscribers with live streaming audio of 2,500 MLB games per season.
Apr 4, 2005
mSpot launches its mobile telephone streaming audio service on Sprint's network.
Apr 13, 2005
XM announces partnership with Zipcar to install XM radios.
May 4, 2005
Westwood One and the NFL extend the agreement for Westwood One to continue as the exclusive network radio home of the NFL.
May 16, 2005
Infinity Broadcasting launches KYOURADIO, the world's first-ever podcasting radio station.
Jun 14, 2005
Sprint announces deal to bring Sirius content to Sprint mobile phones.
Jun 28, 2005
Apple announces new version of iTunes to improve podcasting capabilities, including ability to subscribe to over 3,000 free Podcasts and have each new episode automatically delivered over the Internet to a user's computer.
Aug 16, 2005
XM and Audible.com launch XM Audible store - offering XM content in downloadable format.
Aug 9, 2005
XM announces launch of Spanish language sports channel.
Sep 7, 2005
ABC Radio Networks announces a deal with SparkNet Communications L.P. to develop and market the JackFM radio format, a format considered a direct response to the spread of MP3 players.
Sep 6, 2005
Sirius announces it will air Spanish language broadcasts of NFL games.
Sep 6, 2005
XM announces new women's talk channel featuring Ellen Degeneres and Tyra Banks.
Sep 2, 2005
Sirius announces launch of Cosmopolitan branded women's channel.
Oct 25, 2005
Infinity Broadcasting announces that one-time Van Halen frontman David Lee Roth will replace Howard Stern at its flagship station.
Oct 25, 2005
Infinity Broadcasting launches FREE FM, a bold new FM format, on Infinity stations in four of the top five and seven of the top 10 U.S. radio markets, as part of its Howard Stern replacement strategy.
Oct 31, 2005
Sirius and DaimlerChrysler extend exclusive relationship.
Oct 31, 2005
Sprint announces Sprint Music Store, the first over-the-air music download service in the U.S.
Nov 2, 2005
XM announces its service will be factory installed option in Nissan models
Nov 14, 2005
Cingular and MobiTV announce MobiRadio Service, offering 40 channels of mobile radio service to Cingular devices.
Nov 15, 2005
XM announces that 72 XM channels are available to DirecTV subscribers.
Jan 2005
Feb 2005
Mar 2005
Apr 2005
May 2005
Jun 2005
Jul 2005
Aug 2005
Sep 2005
Oct 2005
Nov 2005

Competitive Response Timeline



Response Timeline

SIRIUS



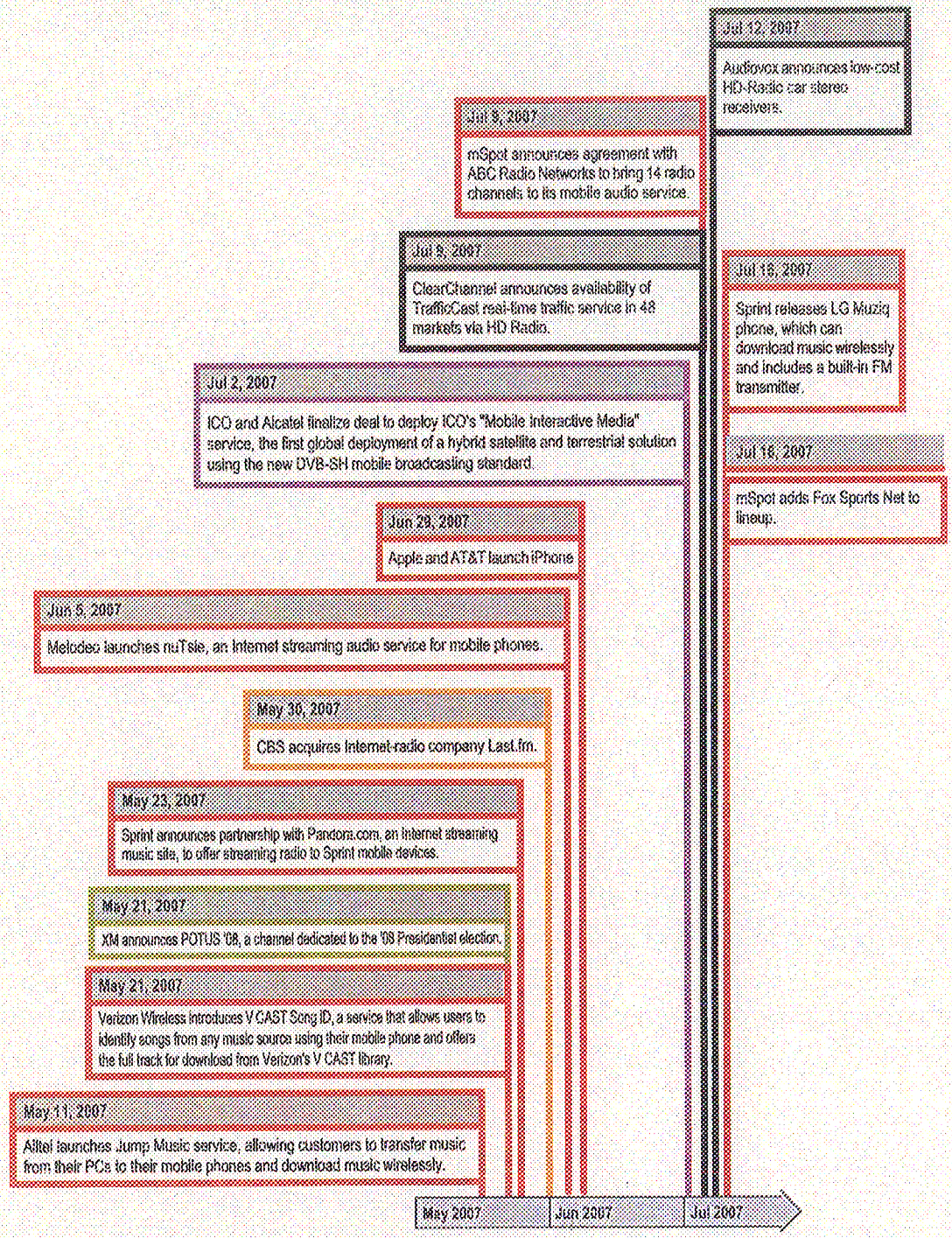

Jul 12, 2007
Audiovox announces low-cost HD-Radio car stereo receivers.
Jul 9, 2007
mSpot announces agreement with ABC Radio Networks to bring 14 radio channels to its mobile audio service.
Jul 9, 2007
ClearChannel announces availability of TrafficCast real-time traffic service in 48 markets via HD Radio.
Jul 18, 2007
Sprint releases LG Muziq phone, which can download music wirelessly and includes a built-in FM transmitter.
Jul 2, 2007
ICO and Alcatel finalize deal to deploy ICO's "Mobile Interactive Media" service, the first global deployment of a hybrid satellite and terrestrial solution using the new DVB-SH mobile broadcasting standard.
Jul 16, 2007
mSpot adds Fox Sports Net to lineup.
Jun 29, 2007
Apple and AT&T launch iPhone
Jun 5, 2007
Melodeo launches nuTsie, an Internet streaming audio service for mobile phones.
May 30, 2007
CBS acquires Internet-radio company Last.fm.
May 23, 2007
Sprint announces partnership with Pandora.com, an Internet streaming music site, to offer streaming radio to Sprint mobile devices.
May 21, 2007
XM announces POTUS '08, a channel dedicated to the '08 Presidential election.
May 21, 2007
Verizon Wireless introduces V CAST Song ID, a service that allows users to identify songs from any music source using their mobile phone and offers the full track for download from Verizon's V CAST library.
May 11, 2007
Alltel launches Jump Music service, allowing customers to transfer music from their PCs to their mobile phones and download music wirelessly.
May 2007
Jun 2007
Jul 2007

EXHIBIT F

SIRIUS-XM JOINT OPPOSITION
MB Docket No. 07-57
July 24, 2007

DR. CHARLES L. JACKSON,
SERVICE AND SPECTRUM ALTERNATIVES FOR AUDIO NEWS AND ENTERTAINMENT

Service and Spectrum Alternatives for Audio News and Entertainment Services

Charles L. Jackson

July 24, 2007

The author is grateful to XM Satellite Radio and Sirius Satellite Radio for support in preparing this report. However, the opinions and conclusions expressed in this report are those of the author and do not necessarily represent the views of any other party.

Table of Contents

Introduction and Summary

This report reviews alternative wireless options for the delivery of audio services. In particular, it considers alternative service options with characteristics similar to those of the services provided by the two satellite radio companies XM Satellite Radio (XM) and Sirius Satellite Radio (Sirius). This report considers services that include or could include the following key features:

- Multiple channels
- Subscription services
- Some live channels (news, sports)[1]
- Wide geographic availability

The following are features that some services offer that are not provided by XM and Sirius today:

- On-demand programming (e.g., iTunes downloads, MediaFLO ClipCasts)
- Multiple levels of audio quality (higher bit-rate service options)
- A wide variety of text and video programming

Two major classes of alternative systems are considered—those that can be implemented by licensees today or with minor changes in the FCC's rules and those that require the FCC to issue new licenses or to make major changes in its rules. The first category is illustrated by QUALCOMM's MediaFLO service—QUALCOMM or its customers can reconfigure the system to expand its audio channels immediately; QUALCOMM previously indicated that it would transmit 15 video channels and "numerous" audio channels.[2] Similarly, a new generation of mobile satellite systems is soon to be launched; regulation permits these systems to offer SDARS-like services and at least one mobile satellite operator has announced plans to do so.

The second category is illustrated by the television white space. The FCC could license the white space for use by a multi-channel audio distribution service, thereby converting

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[1] Many of the programs provided by XM and Sirius are prerecorded. For example, XM transmits *Willie's Gospel Jukebox* on Sunday mornings with encore performances (transmissions of recorded materials) on Sunday evening, Wednesday, and Saturday. Each day, Sirius transmits several operas that were recorded by the Metropolitan Opera. Sirius also transmits live performances from the Met during the season.

[2] QUALCOMM Press Release, http://www.qualcomm.com/press/releases/2004/041101_mediaflo_700mhz.html.

what might be characterized as a prospective option into an available option. Such *options are true options for the FCC—should the FCC feel that there should be more* capacity or more alternatives for audio distribution, the FCC can create those alternatives.

The report also considers technological options, such as multi-band operation and content caching, that supplement the transmission capacity of the various alternatives.

Depending on how one counts, there are about a dozen alternate wireless delivery paths for audio services capable of supporting hundreds or thousands of channels. These alternate paths are controlled by a variety of firms, with each firm bringing its own approach to the digital distribution of media content to mobile consumers.

Some of these alternatives, such as AT&T Wireless's audio services, already offer dozens or hundreds of channels. Other alternatives, such as V Cast Mobile TV from Verizon Wireless and ICO's soon-to-be-launched interactive multi-media service, provide additional services such as video or games. Many of these alternatives include storage and replay capabilities that were not affordable at the time XM and Sirius committed to their system architecture and that are not available in the receivers most XM and Sirius customers have today.

The combination of existing alternatives—systems operating today, licensed systems in the process of being built out, spectrum not yet licensed, unlicensed spectrum, and spectrum that the FCC could make available for audio services—together with a variety of sophisticated storage and playback designs create an enormous universe of media choices for consumers. Some of these alternatives include service options that XM/Sirius's satellite-delivered services lack and that would be difficult or impossible to provide using their respective system architectures.

Alternatives to XM/Sirius Services

This report identifies roughly a dozen existing wireless services that have the capacity and technical capability to provide an alternative to XM/Sirius for many consumers. These alternatives fall into four broad categories: existing broadcasters (FM and TV), broadband terrestrial service providers (MediaFLO, Hiwire, Crown Castle, Sprint, Clearwire), commercial mobile radio service providers (cellular, PCS, AWS), and satellite services (mobile and fixed). A fifth alternative, the wireless communications service (WCS), is also relevant even though it falls between classifications—it can be regarded as either a broadband terrestrial service or a mobile satellite service, and licensees can do either with their current licenses. Unlicensed spectrum provides yet another distribution path.

This report also reviews a number of spectrum opportunities—regions in the spectrum where the FCC could create a radio service that would be well suited to providing a service similar to that provided by XM/Sirius. Perhaps the most attractive of such spectrum regions is the television white space—those parts of the television spectrum that are not occupied by television signals and where it would be possible to put other signals without creating unacceptable interference to household television reception.

Finally, this report discusses technological options, such as storing content for later replay and using multiple bands to deliver service, that can allow service providers to provide services offering a mix of features. Specific options are discussed below.

Before exploring these alternatives, we note an important difference in bandwidth requirements for XM/Sirius and for terrestrial services. When comparing SDARS bandwidth and capacity with the bandwidth and capacity of other alternatives, the difficult problems of providing satellite service to receivers in automobiles must be kept in mind. Satellite signals are relatively weak and are easily blocked by buildings and trees. To compensate for such blocking, XM and Sirius normally transmit three signals

each carrying a copy of the program stream.[3] These signals come from different directions and carry the programming with a short delay between signals. Thus, if the signals to a receiver are blocked for a few seconds, say as a car drives beneath an underpass, the receiver can reconstruct the desired programming by combining the information received before the car went beneath the underpass with the information received after the car went beyond the underpass. If signals are blocked from one direction, they can be picked up from another. This triple reception, with redundancy in time and space, greatly increases the reliability of the satellite program service, but at the expense of significant bandwidth. Roughly speaking, the 25 megahertz of the SDARS band (XM and Sirius combined) is equivalent to about 8 megahertz of non-satellite spectrum.

Existing Broadcasters

FM Broadcasters

The digital capability now enjoyed by FM broadcasters creates a capacity expansion option. Currently, some FM broadcasters operate in a hybrid mode in which the primary use of the digital signal is to duplicate the analog signal. Digital receivers can pick up the digital version; traditional analog receivers can pick up the analog version.

The digital technology used by FM broadcasters permits them to increase their digital transmissions—many FM broadcasters already broadcast an additional one or two HD audio programming services in addition to duplicating their analog signal.[4] If they discontinue their analog operations, switching to an all-digital format would give an FM broadcaster an additional 100 to 125 kilobits per second of capacity.[5] This added capacity would then permit a broadcaster to offer three or four additional audio program services.[6]

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[3] The systems transmit two satellite signals and a terrestrial signal—each signal carrying the same information.

[4] Among the top 5 station groups, in terms of numbers of stations, as of June 1, 2007, about two-thirds of those stations broadcasting in HD were also broadcasting HD multicasts. BIA Financial Network, "HD Radio™ Trends," *at* http://www.bia.com/hd_radio_trends.asp.

[5] The capacity increment varies depending on the service mode chosen by the broadcaster.

[6] *See Second Report and Order, First Order on Reconsideration, and Second Further Notice of Proposed Rulemaking*, In the Matter of Digital Audio Broadcasting Systems And Their Impact on the

An additional three channels would not make an FM station's service resemble that of XM/Sirius. But, in a location receiving the signals of 10 FM stations, the expanded capacity would be a substantial increase in over-the-air radio service. If the broadcasters were to coordinate their channel format choices or were to wholesale their added capacity to a single service provider, then the added FM capacity would support a subscription multichannel, multimedia service.[7]

Television Broadcasters

Digital television signals consist of a 20 megabit per second bit stream—a bit stream that can be used to provide a wide variety of services. The signaling technology—or modulation format—used for digital television in the United States does not work well with mobile receivers. Consequently, in recent years there has been a significant effort to create a modulation format that is compatible with the existing digital television equipment but that provides a reliable service to handheld and car-mounted receivers. Major manufacturers have demonstrated such capabilities; the National Association of Broadcasters announced its support for such developments;[8] and the Advanced Television Systems Committee (ATSC) recently received several proposals for system designs that could form the basis of a standard for a reliable mobile service delivered on a television signal.[9]

It appears almost certain that any such service will have less capacity per megahertz than does digital television—probably about one million bits per second per megahertz—or

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Terrestrial Radio Broadcast Service, FCC, May 31, 2007, FCC 07-33. The FCC stated "The ultimate goal of this proceeding is to establish a robust and competitive all-digital terrestrial radio system."

[7] The HD Digital Radio Alliance, a consortium of terrestrial broadcasters, was formed in part so that members could coordinate programming formats. *See* John Borland, *Broadcast giants join forces on HD radio*, CNET NEWS.COM, Dec. 6, 2005, *at* http://news.com.com/Broadcast+giants+join+forces+on+HD+radio/2100-1038_3-5984476.html ("The member organizations will be coordinating programming decisions on these extra channels, which the industry is calling HD2, hoping to avoid overlaps . . . . Thus, if two stations both want to broadcast classic rock, for example, the Alliance will assign it to just one station, pushing the other to pick a different format.").

[8] See "NAB Supports Expedited Development of Mobile DTV Broadcast Service," NAB Press Release, June 22, 2007.

[9] See "Request for Proposal for ATSC-M/H—A Backwards Compatible Mobile and Handheld Standard," ATSC Technology & Standards Group (TSG), TSG DOC #750r1, June 13, 2007. See also, "ATSC Receives Proposals for Mobile and Handheld Standard," ATSC Press Release, June 22, 2007.